

CLAIMS:

1. An ultrasonic transmitting and receiving apparatus comprising:

an ultrasonic transducer array including a plurality
5 of ultrasonic transducers arranged in a matrix form;

waveform information setting means for setting waveform
information to be used for transmitting a plurality of
ultrasonic beams, each of which is synthesized by a plurality
of ultrasonic signals having amplitude and phase
10 characteristics represented by Bessel function, within a
predetermined period; and

drive signal generating means for generating a plurality
of drive signals for respectively driving said plurality of
ultrasonic transducers included in said ultrasonic transducer
15 array on the basis of the waveform information set by said
waveform information setting means.

2. The ultrasonic transmitting receiving apparatus
according to claim 1, wherein said waveform information
setting means sets said waveform information so that said
20 plurality of ultrasonic beams are transmitted from different
areas included in said ultrasonic transducer array,
respectively.

3. The ultrasonic transmitting receiving apparatus
according to claim 1, wherein said waveform information
25 setting means sets said waveform information so that said
plurality of ultrasonic beams are transmitted from the same
area included in said ultrasonic transducer array.

4. The ultrasonic transmitting receiving apparatus according to claim 1, further comprising:

delay time setting means for setting delay time of the ultrasonic signals in said drive signal generating means so
5 that said plurality of ultrasonic beams are steered; and
image generating means for generating an ultrasonic image on the basis of detection signals obtained by receiving ultrasonic echoes.

5. The ultrasonic transmitting receiving apparatus
10 according to claim 2, further comprising:

delay time setting means for setting delay time of the ultrasonic signals in said drive signal generating means so that said plurality of ultrasonic beams are steered; and
image generating means for generating an ultrasonic
15 image on the basis of detection signals obtained by receiving ultrasonic echoes.

6. The ultrasonic transmitting receiving apparatus according to claim 3, further comprising:

delay time setting means for setting delay time of the
20 ultrasonic signals in said drive signal generating means so that said plurality of ultrasonic beams are steered; and
image generating means for generating an ultrasonic image on the basis of detection signals obtained by receiving ultrasonic echoes.

25 7. The ultrasonic transmitting receiving apparatus according to claim 1, further comprising:

control means for controlling at least one of a position

of said ultrasonic transducer array and an orientation of an aperture thereof; and

image generating means for generating an ultrasonic image on the basis of detection signals obtained by receiving
5 ultrasonic echoes.

8. The ultrasonic transmitting receiving apparatus according to claim 2, further comprising:

control means for controlling at least one of a position of said ultrasonic transducer array and an orientation of
10 an aperture thereof; and

image generating means for generating an ultrasonic image on the basis of detection signals obtained by receiving ultrasonic echoes.

9. The ultrasonic transmitting receiving apparatus
15 according to claim 3, further comprising:

control means for controlling at least one of a position of said ultrasonic transducer array and an orientation of an aperture thereof; and

image generating means for generating an ultrasonic
20 image on the basis of detection signals obtained by receiving ultrasonic echoes.